Booklet 1 of 2

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The effect of energy and traffic light labeling on parents purchasing decisions of cereals for their children.

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Abstract

Objective: Nutritional labeling systems are considered a tool to fight obesity since they aim to contribute for more informed food choices as well as assist consumers to make healthier nutrition options and in this manner, contribute to a decrease in the obesity rate. This study intends to analyze the effect of different types of labeling systems on parents' purchasing decisions for their children on a specific product: breakfast cereals. More precisely, how labels affect parents' perception of healthiness regarding cereals and if the nutritional information has an effect on intended purchases for their children.

Participants and methods: We conducted a study with 135 Portuguese parents of children aged 4 to12 years. Parents answered a questionnaire with one of three hypothetical cereals menus. Menus only differed in their nutritional labeling technique: no labels (control group), reference intake labels or traffic light labels. In addition, we conducted 20 face-to-face interviews to a different group of parents in order to perform a recall task.

Findings: This paper provides no evidence to suggest that energy labeling or traffic light labeling systems alone were successful in helping parents making healthy purchases of cereals for their children. Therefore, there is the need to promote supplementary policies to encourage the consumption of healthier food and help fight obesity.

Keywords: cereals, nutritional labeling, parents, child, obesity

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Introduction

According to the World Health Organization (WHO), obesity is the second principal cause of death in the world that could be prevented. The growth rate of child obesity in particular is a serious concern since 60% of children who are overweight in their childhood are expected to continue to be overweight as adults (WHO, 2009). Child obesity is a serious problem of public health as obese children have a higher probability of developing serious health problems. In Portugal, 1 out of 3 children are overweight. Portuguese children consume fast food, sweets and sodas at least 4 times per week[1]. To stop this trend, WHO released a new guideline suggesting that adults and children should reduce their intake of sugars to less than 10% of their total energy intake[2].

Breakfast cereals are one of the products that present problems in regards to their sugar levels, although manufacturers claim them to be healthy food. When giving cereals for their children, most parents believe they are making a healthy choice not realizing they are giving a product with a high sugar content. Despite programs such as the EU pledge that use commercial communications to support parents making healthier options for their children[3], the cereals that children consume the most still have big quantities of sugar (Euromonitor: Breakfast Cereals in Portugal, 2014). An alternative policy aimed to improve public nutrition and help consumers make more informed choices is nutritional labeling. This paper aims to investigate the effect of the energy and traffic light labeling on parents purchasing decisions of cereals for their children or if there is a need to advocate for public policy measures in ways that promote health and fight child obesity. An example in Portugal where public policy was used to reduce the consumption of a nutrient was with the Law n. º75/2009[4], where it was established a limit of salt on bread.

[1] http://www.apcoi.pt/obesidade-infantil/ [Accessed 16 September 2015]
[2] http://www.who.int/mediacentre/news/releases/2015/sugar-guideline/en/ [Accessed 15 September 2015]
[3] http://www.eu-pledge.eu [Accessed 16 September 2015]
[4] http://www.portaldasaude.pt/portal/conteudos/a+saude+em+portugal/noticias/arquivo/2009/8/teor+sal+no+pao.htm [Accessed 15 September 2015]

Literature Review

Obesity Challenge

Child obesity and child overweight represent an important issue of public health in almost all regions of the world. By 2013 there were 42 million overweight children under the age of 5 (WHO, 2013) and 155 million in school age (Associação Portuguesa Contra a Obesidade Infantil).

In Europe, every year 400 000 children become overweight and join the 14 million already existing, from which 3 million are obese (Plataforma Contra a Obesidade Infantil[5]).

Among other diseases, being obese increases the risk of type 2 diabetes, hypertension, several types of cancers and cardiovascular problems. Additionally, obesity reduces life expectancy by 9 years (Associação Portuguesa dos Nutricionistas). Taking into consideration these severe consequences for public health, obesity was classified as the epidemic of the 21st century.

The combination of unhealthy eating behaviors with a sedentary lifestyle are two of the biggest responsible factors for the present levels of child obesity in the world. Children today are facing a combination of upsetting trends that greatly contribute to the present unhealthy dietary patterns, such as the increase in the advertising and marketing of energy-dense food, the increase in the portions of fast food, the rise in the accessibility to snacks that are high in fats, sugars and carbohydrates, together with the growing use of soft drinks to replace water (Lobstern et al., 2004; Kline, 2004).

One of the purposed policies of the Commission on Ending Child Obesity is to "take action to reduce the intake of unhealthy foods and sugar-sweetened non-alcoholic beverages and promote the intake of healthy foods by children and adolescents."[6].

According to the American Heart Association (AHA), the recommended daily sugar intake is

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5 http://www.plataformacontraaobesidade.dgs.pt/PresentationLayer/textos01.aspx?cttextoid=191&menuid=195&exmenuid=195 [Accessed 17 September 2015].

6 http://www.who.int/end-childhood-obesity/commission-ending-childhood-obesity-draft-final-report-en.pdf [Accessed 2 October 2015]

5 teaspoons for an adult woman, 9 teaspoons for an adult man and 3 teaspoons for children[7]. However, a study conducted by the AHA found that the Americans typically consume 22.2 teaspoons of sugar per day. In addiction, children between 1-3 years old usually intake 12.2 teaspoons of daily sugar, which is more than what is recommended for the adults. The situation is even more severe among American teenagers that are consuming 34 teaspoons of sugar every day (Johnson, 2009).

A new guideline from WHO highly suggests that adults and children should reduce their intake of free sugars to less than 10% of total energy intake throughout their lives in order to control unhealthy excess weight. WHO defines free sugars as "monosaccharides and disaccharides added to food or naturally present in honey, syrups, fruit juices, and fruit concentrates"[8]. According to the Director of WHO's department of Nutrition for Health and Development: "We have solid evidence that keeping intake of free sugars to less than 10% of total energy intake reduces the risk of overweight, obesity and tooth decay."[9] (WHO, 2015).

The Role of Marketing

Children characterize three different markets: (1) the primary market, which targets children themselves; (2) the influence market, which represents the influence children have on family purchases/on decision makers; (3) the future market, which acknowledges children as future adult consumers (McNeal, 1992).

American children aged between 4-12 spend $42 billion as primary consumers. Furthermore, they influence directly and indirectly more than $700 billion on family purchases. Taking into account spending and influence data of teenagers aged between 14-18, American children are worth nearly $1 trillion (McNeal, 2007).

The food and beverage industries have recognized children and adolescents as a strong market

[7] http://www.heart.org/HEARTORG/GettingHealthy/NutritionCenter/HealthyEating/Added-Sugars_UCM_305858_Article.jsp#.Vo7_UDZIg9d [Accessed 1 October 2015]

[8] http://www.who.int/elena/titles/ssbs_childhood_obesity/en/ [Accessed 19 September 2015]

[9] http://www.who.int/mediacentre/news/releases/2015/sugar-guideline/en/ [Accessed 15 September 2015]

and consequently they are being targeted by powerful food advertisers (Story and French, 2004). Several studies demonstrated that children food advertising is dominated by unhealthy food high in sugar and fat such as pre-sugared breakfast cereals, confectionary snacks and soft drinks (Hastings, Stead, McDermott, 2003; McGinnis, Gootman and Kraak, 2006; Story and French, 2004).

Multiple techniques and methods are used to target children such as television, online advertising, point-of-purchase communications and sponsorships of events (Shimp, 2007). Moreover, there is evidence that marketing techniques have an effect on winning children's attention as a consequence of constant exposure (Jones, 2010).

Concerns about the results of marketing strategies on children have raised issues about the need for tighter controls on food advertising to children (Story and French, 2004). The increasing awareness of commercial pressure on children, together with a growing number of covert marketing practices, has resulted in specific regulations in the majority of the members of the European Union concerning marketing efforts to children (Valkenburg, 2000).

Regarding food advertisement, it was launched in 2007 the EU pledge as part of signatories' commitment to the European Union Platform for Action on Diet, Physical Activity and Health. The EU Pledge[10] is a voluntary initiative that aims to change food and beverage advertising to children under the age of 12 in the European Union and is leaded by food and beverage dominant companies. The initiative comprises two main commitments:

- No advertising for food and beverage products to children under the age of 12 on TV, print and internet, except for products which fulfill common nutritional criteria;
- No communication related to products in primary schools, except where specifically requested by, or agreed with, the school administration for educational purposes.

Big companies such as Nestlé, Unilever and Coca Cola are examples of EU pledge members.

[10] http://www.eu-pledge.eu/content/about-eu-pledge [Accessed 16 September 2015]

In fact, all the member companies represent over 80% of food and beverage advertising expenditure in the EU.

At a national level, there are other regulations regarding children such as the *Código de Auto-regulação em Matéria de Comunicação Comercial de Alimentos e Bebidas Dirigida a Crianças*[11], which contains the principals and norms to apply in situations where there is commercial communication related to children under the age of 12. It works as an element of support to the national actions for the prevention of certain eating habits, such as the Platform Against Obesity and General Direction of Health.

Breakfast cereals

- **Cereals**

In Portugal, more than 4 million people affirm to eat cereals for breakfast, which represents 49.7% of the residents in the continent (Marktest, 2015).

In the past 4 years, the breakfast cereal market has suffered some changes, one of the most relevant being the share of shelf growth of breakfast cereals for children that now represents 37% of the total (Marktest, 2015).

Nestlé is the top brand for cereals with a 33% retail share value, being present in 68.1% of total houses with children, followed by Kellogg's which is present in 29.1% (Marktest 2003 and Euromonitor: Breakfast Cereals in Portugal, 2015). *Chocapic* and *Estrelitas*[12], which belong to Nestlé, are the top preferred brands in the Portuguese breakfast cereal market for children (Euromonitor: Breakfast Cereals in Portugal, 2014).

Consuming breakfast cereals has been associated with positive results for health. However, in the latest years, many breakfast cereal brands started being evaluated and criticized for not being as healthy as manufacturers claim (Euromonitor: Breakfast Cereals in Portugal, 2015). Children's breakfast cereals have more energy, sugar and sodium additionally to having less

[11] http://www.gmcs.pt/ficheiros/pt/codigo-de-autorregulacao-em-materia-de-comunicacao-comercial-de-alimentos-e-bebidas-dirigida-a-criancas.pdf [Accessed 25 September 2015]

[12] The international name of these cereals is CocoCrunch and Honey Stars

fiber and protein, in comparison with adult's cereals (Schwartz, 2008)**.** Besides, evidence shows that breakfast cereals is one of the most marketed group of food targeted to children (Cairns, 2013; Alvy and Calvert, 2008) and for many kids breakfast cereals are part of their daily life more than once per day (Sepp, 2002; Marktest, 2015). Additionally, most parents are not aware of the sugar content present in their children's breakfast cereals and they say no to dessert for breakfast when many children's cereals have just as much sugar or more than a dessert (Pestano, 2011) **(Figure 1).**

Figure 1: Sugar quantities

Source: Pestano (2011)

The Role of parents

Optimal nutrition is important at all phases of growth for both good health and well-being, and it is particularly essential during the infantile phase, as there is evidence that eating habits in childhood will continue into adulthood (Rees and Show, 2007; Story, 2002).

Parents are one of the most influential factors into the child nutrition-related consumer behavior (Kraak and Pelletier, 1998). They act as purchase agents and at the same time as consumer educators, since they are the mediating force between their children and the purchase of the products their children want/ask for (Mehrota and Torges, 1976).

Parents' role is especially important due to children lack of self control. In a recent study conducted by Harris (2014), it was found that 100 per cent of participant children exhibited EAH (Eating in Absence of Hunger), accepting unhealthy snacks just 15 minutes after completing a healthy lunch even tough 80% reported to be full or very full.

Despite all the advertisement and marketing campaigns directed to children, parents believe they still are the biggest influence on their children behavior (Spungin, 2004), and they are involved and concerned in encouraging healthy nutritious behaviors for their children (Kraak and Pelletier, 1998). Moreover, there is evidence that nutritious parental modelling leads to an

improved dietary patterns concerning children (Brown, 2008). Thus, parents should provide their children the skills to practice healthy behaviors and inspire them to be more responsible regarding their health (Story, 2002).

Nutritional Labeling Legislation in the European Union

In 1979 it was introduced the first Directive controlling food labeling. By September of 1990, the nutrition labeling was harmonized throughout the European Union: it is optional, but becomes compulsory if a nutrition claim appears on the label or in advertising (Council Directive 90/496/EEC)[13] and it will become mandatory in all products by 2016[14].

Nutrition labeling regulation aims to help consumers to adopt informed food choices and opt for healthier options by avoiding the possibility of consumers to get confused in perceiving if the product is healthy or not. It is one way that consumers have to acquire knowledge about the food they are considering buying (Wandel, 1997) and at the same time it is interpreted as one of the measures to confront obesity.

Reference Intake Labeling System

Nowadays it exists a harmonization of nutritional labeling in Europe, and Portugal is no exception. FIPA – *Federação das Indústrias Portuguesas Agro-Alimentares* developed a system of nutritional labeling that respects the European Legislation. This nutritional labeling is based on scientific studies from which were established the "Guideline Daily Amount (GDA) scheme" (Cordeiro, Silva e Bento, 2010). In 2011, the daily percentage for reference intakes was recognized in EU legislation (Regulation (EU) 1169/2011). Furthermore, the regulation has introduced the new term "Reference Intake (RI)", which corresponds to the term "GDA" (Food Drink Europe, 2014).

[13] http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=URISERV:l21092 [Accessed 26 September 2015]
[14] http://ec.europa.eu/food/safety/labelling_nutrition/labelling_legislation/index_en.htm [Accessed 26 September 2015]

The RI shows the amount of calories, sugar, fat, saturated fat and salt that exists in each portion of the product and it also provides information on what each portion represents as a percentage of an average person's daily dietary need (Food Drink Europe, 2014).

It has been shown that children have difficulties in understanding how to use food labels since children do not know how the nutrient levels can be used to guide food decisions (Lytle, 1997). On the other hand, parents that are concerned with the nutrition of their children, could use the nutritional packaging to make healthier choices for them. However, Cowburn and Stockley (2005) found that consumers who look at nutritional information are able to understand some of the terms but are frequently confused about certain types of information. The difficulties and reasons mentioned by consumers to not read the label are mainly the lack of time, the size of the information and the lack of knowledge regarding the terms used.

Traffic Light Labeling

The traffic light labeling system was developed by the Food Standards Agency (FSA), and it uses the traffic light colors to help consumers quickly understand the meaning of the nutrition in the contained product: **Red** - indicates that the food is high in fat, sugars or salt; **Amber** - makes it an ok choice; **Green** - makes it a healthy choice. (Food Standards Agency, 2010)

FSA added to this color front pack labeling, the contribution of the product to the Reference Intakes (Cordeiro, Silva e Bento, 2010).

According to the WHO: "Such a labeling system should be consistent and compulsory in each country and – better still – internationally."[15]

Controversially, a study testing the effect of energy and traffic light labeling on parents and child fast food selection found that there is no evidence to suggest that any labeling system alone was successful in reducing the energy intake of fast food items selected (Dodds, 2013). However, there are no studies on the effect of energy and traffic light labeling on parents

[15] http://www.who.int/bulletin/volumes/92/11/14-031114/en/ [Accessed 25 September 2015]

purchasing decisions of cereals for their children.

Hypothesis

Attitude towards their children's nutrition

Parents' patterns play a crucial role in children's lives since they are the role models for them. Also, children's food preferences are influenced by parents' choices and eating habits (Caruana and Vassalo, 2003; Brown, 2008; Moreira, 2008). Furthermore, parents prefer healthy food for themselves and their children (Levin and Levin, 2010) and therefore it will be expected that: **H1: Parents care about the nutrition of their children**

Attention to the nutritional information

According to past literature, there is evidence that the majority of consumers read nutrition labels regularly or at least sometimes (Cowburn and Stockley, 2005). Assuming that parents keep the same behavior when purchasing food items for their children: **H2: Parents read the nutritional information on the package when they are buying cereals for their children.**

Perceived healthiness

Parents have a reason to be worried about the levels of sugar present in their children's breakfast cereals (Pestano, 2011). Nonetheless, as already mentioned, consumers are not able to fully understand the information contained in RIs nutritional labels and claim they do not have sufficient knowledge (Cowburn and Stockley, 2005). However, perceived healthiness of foods is influenced most often by the label format (Borgmeier and Westenhoefer, 2009) and consumers reported that, when using the traffic light labels, they are able to compare faster the healthiness of food products and they are five times more likely to correctly identify healthier food products when compared to the RIs system (Kelly, 2008). Taking this into consideration, it can be stated that: **H3: The presence of a traffic light labeling system will have a higher effect on the perceived healthiness of cereals for children when compared with no nutritional information or with the RIs nutritional labels.**

Intention to purchase

Changes in perceived healthiness and the use of labels are unlikely to impact consumers' food

choices and consumption (Borgmeier and Westenhoefer, 2009). Moreover, according to past literature labeling has no effect in reducing the energy of fast food items intended purchases made by parents for children (Dodds, 2013). Admitting that parents' behavior will be the same as fast food for cereals purchases: **H4: The presence of nutritional information on cereals with a high content of sugar will have no effect on influencing parents' cereal choices for their children.**

Methodology

Sample

The sample of this study was composed of 135 Portuguese parents of children aged between 4 and 12 years. Only parents were considered since children do not have sufficient knowledge to fully understand nutritional labels (Lytle, 1997). A total of 240 questionnaires were delivered to the director of a group of public schools and 159 were received (66.25% response rate) but only 135 were valid. We conducted a complementary study to deepen some insights, for which a different sample of 20 parents of children within the same age range was interviewed.

Research Design

Quantitative Research

The data was collected through individual questionnaires answered by parents **(Appendixes 3, 4 and 5)** since these can reach a larger number of people, allow data to be consistent as responses are limited to the alternatives stated and they are also more appropriate to collect sensitive data because they ensure anonymity (Malhotra and Birks, 2007).

In cases where parents had more than one child aged between 4 and 12, the child with the most recent birthday was selected (Dodds, 2013). Parents were assigned to one of the groups in the experiment. Following the same procedure from Dodds (2013), we presented each group with a different stimulus – a hypothetical cereal menu –which contained a variety of cereals present in the Portuguese market. The stimulus was manipulated in order to vary the

type of nutritional information presented in the packaging (dependent variable), hence, creating three groups:

Group 1 (Control group)*:* Cereal menu with no nutritional information. The menu contained 8 packages of cereals, including a balanced number of healthy and unhealthy options (high/low content of sugar). Cereals were present in a standard order in each menu.

Group 2 (experimental group A)*:* The same menu was presented but with nutritional information using the reference intake labeling system.

Group 3 (experimental group B)*:* Same as group 2 but used the traffic light labeling system instead. It uses the traffic light colors (red, amber and green) to express the levels of fat, saturated fat, sugar and salt contained in each package of cereal presented in the menu.

In order to encourage participants and increase response rates, a cover letter explaining the relevance of my work and the importance of parents' participation was presented on the first page of the questionnaire **(Appendix 1)**. Furthermore, the cover letter also had the purpose of transmitting to parents that all the results were confidential and that there were no right or wrong answers (Smith and Albaum, 2012)**.**

A pre-test was conducted with 7 parents to validate the questionnaire and confirm that the questions were clear, relevant and understandable. In the pre-test, parents took approximately 8 to 10 minutes to fill the questionnaire. Parents found the questionnaire easy to answer and not too long. However, some suggestions regarding some terms were taken into consideration and modified based on the comments.

Qualitative Research

Furthermore, in order to deeply understand parents' behavior regarding the labeling systems and in what extent they pay attention and recall the nutritional information, face-to-face unstructured-direct interviews were conducted to a different group composed by 20 parents. In case of parents with more than one child aged between 4 and 12, they would also focus

their responses on the child with the most recent birthday (Dodds, 2013). In order to avoid potential bias caused by information gathered in groups, the interviews were conducted on an individual basis.

During this experience, parents were exposed to 3 different cereals: *Estrelitas*, *Chocapic* and *Cornflakes* since these represent respectively the honey, chocolate and healthier cereals present in the Portuguese market. This specific method was chosen since it allows to obtain information directly from parents, to develop questions naturally over the course of the interview, and to adjust the vocabulary level according to the comfort of each respondent (Smith and Albaum, 2012). During the interviews, 10 parents had access to the packages with the RI labeling system and the other 10 had access to packages with the traffic light labeling system. Each labeling system was tested independently in order to minimize any bias that might result if each person was shown different labeling systems. Moreover, this allowed us to use real packages of cereals instead of images (Kelly, 2008).

Measures

Participants demographic characteristics and children cereal consumption

Participants were asked their age, gender and highest level of education. Moreover, they were asked their child's weekly consumption of cereals (Elfhag, 2008).

Attitude towards the children eating habits

To evaluate parents' attitudes regarding their child's eating habits, participants were asked to measure in a 5-point Likert scale how much they were concerned with their child's nutrition, the scale ranging from "1=not concerned at all" to "5=very concerned" (Etelson, 2003). Furthermore, participants were also asked about the healthiness of their child's eating behaviors, in a 5-point Likert scale ranging from "1=strongly disagree" to "5=strongly agree" (Sun, 2007; Brown, 2007).

Attention to the nutritional information

A 5-point Likert scale ranging from "1=never" to "5=always" was used to evaluate the frequency that parents observe the label (Costa and Calderelli, 2009) as well as to assess how often parents actually use the nutritional information when choosing cereals for their child (Lowe, 2012). Additionally, in order to understand parents' opinion regarding the nutrition labels, a 5-point Likert scale was also used ranging from "1=strongly disagree" to "5=strongly agree" (Lowe, 2012).

To deeply understand if consumers pay attention to the nutritional information, a recall task was conducted during the interviews: after looking carefully at the package of cereal, participants were asked questions such as "what nutritional information did you notice?" (Hammond, 2013).

Perceived healthiness

In order to evaluate if parents have sufficient knowledge about the healthy level of nutrients present in cereal packages, they were asked to rate the adequate levels (low/medium/high) of each nutrient that should be contained per 30g of cereals. Also, after choosing from the menu the package of cereal that they would most likely buy for their child, a 5-point Likert scale was used to measure how healthy parents considered their choice with the scale ranging from "1=very unhealthy" to "5=very healthy" (Lowe, 2012).

Intention to purchase

In order to analyze if the nutritional information on cereals with a high level of sugar has an impact on parents purchase decisions, participants were asked to choose out of the menu which cereal they would be more likely to buy for their child. Furthermore, after choosing the item, parents were asked to rate the importance of several attributes they took into account when deciding. To measure the importance of each attribute a 5-point Likert scale was used ranging from "1=not important at all" to "5=extremely important" (Hughner and Maher, 2006).

Procedure

Interview with nutritionist: An interview with a nutritionist, Doctor Ana Guerra, was conducted to better understand cereals' nutrients and pick the right cereals for the menu. Moreover, the interview also had the purpose of understanding what makes a cereal a healthy option. According to Doctor Ana, a certain cereal is a good option whenever it contains per 100g less than 400Kcal, more than 6g of proteins, less than 10g of fat, less than 5g of saturated fat, and less than 13g of sugar.

Based on these values, 8 cereals from the Portuguese market were selected to be part of the menu: 3 packages with a healthy content of sugar (*Corn Flakes*, *Fitness* and *Fibre1*), the 2 most sold cereals for children (*Chocapic* and *Estrelitas*) and another 3 with an unhealthy level of sugar (*Nesquik, Frosties* and *All Bran*).

Creation of the traffic light labeling: To develop the traffic light labeling system, one followed the categories of low, medium or high established by the FSA (Food Standard Agency, 2010) **(Appendix 5).**

Questionnaires: After developing the questionnaires, they were sent to the director of a group of public schools, all located in Leiria's district. The questionnaires (240) were directly delivered to the director of the institutions, who later randomly delivered them to every parent that had children aged between 4 and 12. Our research was conducted in public schools since social class was not an influence variable in our study.

Parents' interviews: Interviews took place in a Health Care Center, while parents were waiting for the doctor's appointments. Pre-recruiting questions were conducted in order to select parents of children aged between 4 and 12 and that, at the same time, consumed breakfast cereals. Parents that accepted to be interviewed were invited to go to a private office in order to conduct the interview in a more appropriate environment with no interruptions.

In order to reduce method bias created in behavioral research, some techniques were used such as to protect respondent's anonymity and reduce evaluation apprehension. Moreover, we assured interviewees that there were no right or wrong answers and that they should give their honest answer. These techniques made people feel more comfortable in answering the truth instead of changing their responses to become more socially desirable (Podsakoff, 2003).

The interview was divided in 4 short topics. First, parents were asked some demographic information such as age, kinship degree and education level. In the second part, parents were asked about their children's eating habits regarding cereals. Afterwards, parents talked about their relation with cereals' nutritional information. Lastly, a task recall was performed: after allowing them to observe with detail a box of cereals and its nutritional information, they were asked to say what nutritional information they recalled seeing.

Results

Quantitative Research

Participants' demographic characteristics and children's cereal consumption

In total, our sample is composed by 107 mothers, 26 fathers and 2 stepfathers **(Appendix 7)** and the mean age of parents is 39.11 years **(Appendix 8).** 37.8% of the parents from sample have higher education **(Appendix 10)**. Regarding the children weekly consumption of cereals, 54.8% consume cereals like *Estrelitas*, 51.9% consume cereals like *Chocapic* and 17% consume cereals like *Corn Flakes*. **(Appendixes 12, 13 and 14)**

Attitude towards the children eating habits

Hypothesis 1 aims at analyzing if parents are concerned regarding the nutrition of their children **(Appendixes 16 and 17)**. By using frequency analysis one can observe that 96.3% of the parents are *concerned* or *very concerned* with choosing healthy food for their children and with the quantity of sugar present in their children's food **(Figure 2 and 3).** Thus, there is

statistical evidence to **not reject hypothesis 1** and therefore parents do care about the nutrition of their children.

Figure 2: Parents' concern with healthy food

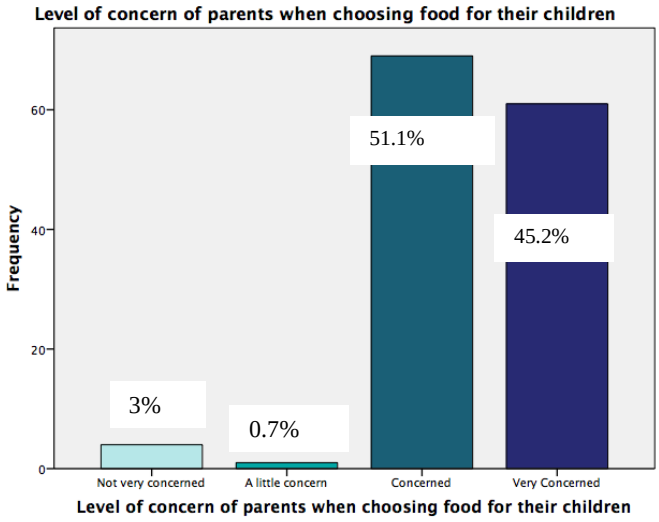
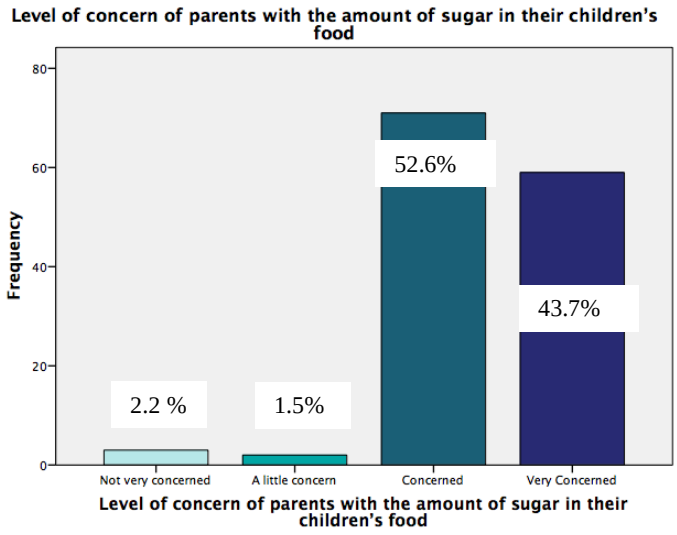


Figure 3: Parents' concern with the level of sugar



Nevertheless, these results may have been biased due to the social desirability effect, with parents declaring they are more concerned than what they actually do.

Furthermore, results show a significant association (p=0.000) between parents that are concerned with choosing healthy food and those who show concern regarding the levels of sugar present in their children food **(Appendix 18)**.

In order to complement the study, parents were also asked information regarding their children's eating habits. Results show that in fact 63% of the parents *agreed* that their children have healthy eating habits, 16.3% *strongly agreed* and only 5.2% *disagreed* with the statement **(Appendix 19).**

Attention to the nutritional information

Hypothesis 2 purpose was to evaluate if parents read the nutritional information, the level of sugar and if they actual use the nutritional information presented in the labels when they are

choosing cereals for their children. This investigation was made through frequency analysis. Besides, one sample T-tests were also conducted to support the results.

By analyzing the cumulative percentages, one can observe that 89.6% of the parents admit to read the nutritional information. Moreover, 88.9% observe the levels of sugar and 88.1% state taking the nutritional information into account when choosing cereals for their children. **(Appendixes 20, 23 and 26)**

The main goal of the T-test was to analyze if the mean of responses is larger than 1, which is the value associated with *never read nutrition label, never observe levels of sugar* and *never use nutritional information* respectively in the 3 cases. Thus, our hypothesis is the same for the 3 analysis: Ho: $\mu=1$ and H1: $\mu>1$. We observed that there is solid evidence ($p=0.000$) that the mean of responses is superior than 1 for the 3 cases, hence we reject the null hypothesis **(Appendixes 22, 25 and 28).** Therefore, parents read and use the nutritional information when choosing cereals for their children, which leads us to **not reject our Hypothesis 2.** Once again, there is the possibility of social desirability bias in the results since some parents may not pay attention to the nutritional labels and answer what they believe is socially appropriate.

Furthermore, it was possible to find a significant correlation ($p=0.000$) between parents who are concerned with choosing healthy food with those who state reading and using the nutritional information when shopping cereals for their children as well as between those who are concerned with the level of sugar and those who observe the level of sugar present in the labeling **(Appendixes 29, 30 and 31).**

More results concerning parents' opinion regarding the nutritional information are presented in **appendixes 32, 33, 34, 35, 36** and **37**.

Perceived healthiness

To evaluate parents' product knowledge regarding cereals, respondents had to allocate the

different components throughout a density scale **(Table 1).** The means of the results are the following:

Table 1 – *Means of the answers given by parents VS Appropriate levels for children according to the nutritionist*

	Low	Medium	High
Energetic value		X	
Protein		X	
Sugar	X		
Saturated Fat	X		
Fiber		X	
Salt	X		

Low	Medium	High
	X	
		X
X		
X		
		X
X		

Out of a possible outcome of 6 right answers, the number of parent's right responses was on average 3.5 **(Appendix 44).** Moreover, the mean of parents' notions of satisfactory levels for energetic value, sugar, saturated fat and salt are correct. On the other hand, their beliefs concerning protein and fiber are, on average, wrong.

Nevertheless, even in the cases where parents are right about the levels of the components, when confronted with real quantities in nutritional labels, they may not be able to associate them to the levels low, medium or high and therefore correctly perceive the healthiness of the product.

Thus, **Hypothesis 3** aims to show that the presence of the traffic light labeling will have a higher effect on the perceived healthiness than the control group and the RI's nutritional label since colors work as an indicator of the level of each component.

After cataloguing perceived healthiness (1 = right and 2= wrong) based on the parent's choice from the menu and their consequent classification as healthy or unhealthy, Chi-square tests were computed between the two treatment groups and between each treatment and the control group **(Appendixes 47, 49 and 51).** Results show that the difference between the 2 treatment groups is significant (p=0.019), as well as the difference between the traffic light

labeling system and the control group (p=0.013). On the other hand, there is no significant difference between the RI's and the control group (p=0.763). Therefore, these results lead us to **not reject Hypothesis 3.**

Intention to purchase

Hypothesis 4 states that the presence of nutritional information on cereals will have no effect on influencing parents' cereal choices for their children. We started by classifying parents' choice as a healthy choice (*Fitness, Fibre 1* or *Corn Flakes*), an OK choice (*All Bran*) or an unhealthy one *(Chocapic, Frosties, Estrelitas* and *Nesquik*), according to their choices from the menu. Afterwards, we performed Chi-square tests to analyze if there were differences in the means between the 2 groups **(Appendixes 53, 55 and 57).** By analyzing the results of the Likelihood Ratio, it is possible to show that there are no differences between the 2 treatment groups (p=0.591), neither between RIs group and control (p=0.726) or traffic light group and control (p=0.986). Hence, there is no statistical evidence that the nutritional information has an effect on parents' purchasing intentions, leading us to **not reject hypothesis 4**.

To better understand what drove parents into their choices from the menu, they were asked to rank several attributes according to the importance they had when they were making the decision. By analyzing the mean of the results, we can observe that for both treatment groups the attribute with the biggest importance on parents' choice was children's preference, while in the control group was the sugar level **(Appendix 58)**. For the RI label group, it was possible to find a significant association (p=0.020) between the importance parents gave to children's preference and the healthiness of the cereals they picked, which is not a surprise since children's most consumed cereals are *Estrelitas* and *Chocapic* that contain high levels of sugar **(Appendix 60).**

Furthermore, for the traffic light labeling we found an association (p=0.010) between parents' level of education and the healthiness of the menu choice **(Appendix 68).**

Qualitative Research

When asked about their children's eating habits, parents stated having a high level of concern on choosing healthy food and making sure that their children have a balanced diet. However, all respondents admitted that from the sample of cereals that was displayed to them (*Chocapic*, *Estrelitas* and *Corn Flakes*), they would buy either *Estrelitas* or *Chocapic* for their children, apart from one mother that besides those, also buys Corn Flakes (some stated that they buy this type of cereal but with a different and cheaper brand). The majority of the sample (14 out of the 20 parents) admitted giving these cereals to their children more than 5 days per week, explaining that their children only eat the cereals if they are chocolate or honey flavored. Moreover, most parents admitted that they are aware that these cereals have a high content of sugar but that the preference of the children was the most important criteria in the decision making process:

- "Once I bought him Corn Flakes because its healthier. They ended up going to the garbage because he did not like them"
- "I buy Estrelitas and Chocapic for my child because it is the only way that I can make him eat in the morning"

Additionally, the majority of the respondents stated not looking to the nutritional information when buying cereals for their children.

- "I do not look to the nutritional information because I do not understand it, it is confusing"
- "I do not find it confusing, but I do not read because the letter is too small"

Most parents that had access to RI label system stated that this nutritional information is only useful to compare between packages and does not allow to understand if the levels are high or low:

- "I only compare sugar between boxes but I have no idea if the level is healthy or not. There should be a scale or a term of comparison explaining if the level is high or low"

Some parents also complained about the lack of healthy breakfast cereals targeting children in the market:

- ” The nutritional information is easy to understand but nowadays there are no healthy options so they have to eat these unhealthy ones”.

Moreover, during the recall task, no respondent was able to remember the level of any nutrient. Also, 9 of the 10 respondents admitted that the the RI label system had no effect on their choices.

Parents that had access to the traffic light labeling system stated that the colors are much easier to understand and since it is located in front of the package there is no way to avoid it:

- “This label is easy to understand. It is immediate and attracts much more the attention of the eye”
- “I believe this label is easier for the majority of the population”

During the recall task, 8 from the 10 participants were able to remember correctly the colors of sugar, fat and salt but not the numbers. However, all participants stated that it would not change their choice unless it was between the same type of cereals, since what influences the most is their children’s preference as they are the ones consuming the cereals.

Discussion and Implications

The aim of this research was to compare the impact of two nutritional information labeling systems in parents’ purchasing decisions of cereals for their children. With this study, we aimed to comprehend if parents care about their children’s nutrition, if they read the nutritional information as well as tried to understand what drives parents’ choices. More exactly, we wanted to understand if different nutritional labels have different effects in perceived healthiness and purchase intentions **(Table 2)**.

Table 2 – *Hypothesis summary*

	Hypothesis	Procedure	Items	Decisions
H1	Parents **care about the nutrition** of their children	Frequency Analysis	Healthy Food Concern Sugar Concern	✓
H2	**Parents read the nutritional information** on the package when they are buying cereals for their children	One sample t-test	Read nutritional information Observe the level of sugar Use the nutritional information	✓

H3	The presence of traffic light labeling system will have a higher effect on the **perceived healthiness** of cereals for children when compared with no nutritional information or with the RIs nutritional labels.	Chi-square	Perceived Healthiness	
H4	The presence of nutritional information on cereals will have no effect on influence parent's **cereal choices** for their children.	Chi-square	Purchase Intentions	

In line with previous literature, our findings suggest that parents **care about their children nutrition** (Levin and Levin, 2010). This might result from the more common awareness concerning the impact of a good nutrition in a child's development. Furthermore, results also suggest that **parents read the nutritional information** when buying cereals for their children regularly or at least sometimes, which was also shown in previous research (Cowburn and Stockley, 2005). Yet, consumers may read the nutritional information but still may not be able to fully understand the terms and the **perceived healthiness.** However, past literature also shows that perceived healthiness is likely to be influenced by the type of label. (Borgmeier and Westenhoefer, 2009). Thus, in accordance, our results show that parents who had access to the traffic light labeling system were more likely to correctly identify if the cereal was healthy or not, when compared to the RI's system and the control group (Kelly, 2008).

Although there is a difference in the perceived healthiness between groups, we found no significant difference in the impact of the two labels on parents' **purchasing decisions** of cereals, suggesting that nutrition information alone does not influence purchasing intentions. One possible explanation for the low influence of the nutritional information labels may be that 97% of parents classified children's preferences as at least *important*, followed by the taste with 94.1%, and according to our findings children prefer honey and chocolate flavored cereals which are not considered healthy options.

These results are consistent with the ones from the interviews where parents had a higher perceived healthiness with the traffic light labeling system, but still would buy the cereals that their children like the most, even if that meant to buy the unhealthy choice.

Nonetheless, we were able to find an association between the level of parents' education and the healthiness of the menu choice, but only when using the traffic light labeling, suggesting that better educated parents are able to choose healthier options with this label system. This may be due to the fact that this format requires less effort and time to comprehended.

This reports aims to increase awareness regarding the high content of sugar present in breakfast cereals in the Portuguese market targeted to children. Moreover, we want to demonstrate that regulations, such as the EU Pledge, and tools aimed at helping parents making more informed choices for their children, such as the different nutritional labeling systems, are shown to not be effective in promoting better food choices since the cereals that children consume the most are still the ones with a high content of sugar. In accordance to the findings of Borgmeier and Westenhoefer (2009), we found evidence that even though parents have a higher perceived healthiness with the traffic light labeling system, this is unlikely to impact their food choices. Therefore, there is a need to advocate for responsible practices that encourage the health of children. This comprises supporting public policy measures with potential to fight child obesity and to develop healthy eating habits.

On the one hand, the reduction in the sugar content of products targeted to children, such as breakfast cereals, could be made through legislation. Thus, it should be taken into reflection the creation of a quota, similar to what was done with salt on bread. On the other hand, companies themselves should be pro active in what concerns limiting the sugar levels in their products directed to children. Companies could also choose to invest in healthier products and apply the same marketing techniques that they use for the unhealthy products to these new and healthier ones. For example, several studies concerning packaging of children's products have shown that marketing techniques can effectively work as an instrument to guide children to make healthier options (Montellano and Agante, 2015; Pires and Agante, 2011). This second option has the disadvantage that companies can be afraid of loosing market share to

competitors due to the reduction on sugar levels. However, the company that would choose to adopt such a strategy could also benefit from first mover advantage to a healthier positioning and, if perceived by the consumer, could enhance its brand image.

Limitations and Further Research

The first limitation of our study is the size of the sample, since we used 3 stimuli, the number of parents per stimulus was relatively small. The second limitation is that this study only comprises data from one geographical area: Leiria. Moreover, the majority of respondents were mothers, further research should comprehend a more balanced sample. Also, a real in-store situation would be more appropriate to better understand the effect of the label systems in the purchasing decision since we were not able to recreate a shopping environment in our study. Lastly, since this study concerns children's nutrition, social desirability effect may be present in some results, as parents may have tended to answer what is socially accepted instead of the truth.

Although it is better for consumers to have access to more information instead of less, results indicate the need for education strategies aimed at improving parents' education in what concerns obesity, nutritional information knowledge and food label reading skills (Krukowski, 2006). Therefore, future research is needed to study the effects of such strategies. Finally, our research was based solely on breakfast cereals, future research should examine the impact of these labeling systems on a wider range of food.

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